

**Oroville Facilities Relicensing  
Environmental Work Group  
Preliminary Issue Sheet**

**T2. Project Effects on Special Status Plant and Animal Species**

**Issue Statement:** Project effects on federal and State listed, species of concern, candidate, proposed, and likely threatened, endangered, sensitive, and special interest plant and animal species and the habitat needed to support them. Concerns include, but are not limited to, amphibians, bald eagle foraging habitat, wintering roosts, and nest territories.

**Resource Goal:**

- Minimize and mitigate adverse project effects on special status plant and animal species
- Promote the expansion of sensitive species

**Scope:** Within the FERC project boundary, and downstream the Feather River floodplain downstream to the confluence of the Yuba River, and other lands outside the boundary as appropriate,

**Existing Information:**

1. California Department of Fish and Game, Natural Diversity Database
2. Agency records (USFS, BLM, State Parks, DWR, CDFG)
3. Letter dated 12/10/99 to D. Russell, DWR from USFWS regarding federally endangered and threatened species list for Relicensing Studies, Butte, County.
4. California Native Plant Society, Inventory of Rare and Endangered Vascular Plants of California.
5. California Department of Fish and Game, Special Plants List, July 2000
6. California Department of Fish and Game, Guidelines for Assessing Effects of Proposed Developments on Rare Plants and Plant Communities
7. California Department of Fish and Game, Wildlife/Habitat Relationships Program
8. US Forest Service, Plumas National Forest, Sensitive and special interest plant species.
9. US Forest Service, Sierra Nevada Forest Plan, Record of Decision, January 2001.
10. US Forest Service, Plumas National Forest, Rare Plant Handbook, August 1999.
11. Butte County Soil Survey, Soil Conservation Service
12. Scientific Literature

**Information Needed:**

1. Maps of soils within project boundary
2. Map of wildlife habitat and plant communities within project boundary produced in studies of Issue T4 (Biodiversity)
3. Literature review and analysis of special status species (ecology and habitats)
4. Identify potential special status species habitats using species information and wildlife habitat maps.
5. Survey for special status plant and animal species using established protocols (such as appropriate seasonal surveying) within the project boundary and ~~downstream~~ Feather River floodplain downstream to the confluence with the Yuba River and other lands outside the boundary as appropriate.
6. Evaluate potential project impacts on each special status species present within the project boundary and downstream Feather River floodplain to the confluence with the Yuba River

**Level of Analysis:** Literature review of each special status species and analysis of vegetation/habitat mapping to determine potential special status species habitats to be surveyed. Level of analyses will vary by species. State and federal threatened, endangered, and candidate species will be field surveyed using agency derived protocols. Other species of concern will be surveyed using standard methodologies. Desktop analysis of potential project impacts on each special status species and its habitat.

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**W5. Effects of Recreation Features on Water Quality**

**Issue Statement:** Effects of existing and future water-based recreation on water quality of project waters. Concerns include MTBE, oils and greases, fuel spills, floating gas tanks, floating septic systems, floating restrooms, houseboat gray water tanks (e.g., nutrients) and pump out facilities.

**Resource Goals:**

- Operate project related recreational facilities and activities to protect suitability of project waters for all beneficial uses. minimize contamination of project waters.
- ~~Ensure suitability of project waters for contact recreation.~~
- ~~Protect project waters for all beneficial uses.~~
- Adequate facilities and measures for safe handling of sanitary and commercial wastes from residential or commercial developments adjacent to project waters.

**Scope:** Within the FERC project boundary and as appropriate outside of project boundary ~~for effects to project~~ waters

**Existing Information:**

1. Goals and criteria from W3.
2. Initial Information Package - identifies and analyzes existing water quality information, summarized in W3.
3. Initial Information Package – identifies existing recreational facilities and activities

**Information Needed:**

1. ~~Completion of Department of Health Services Drinking Water Source Assessment and Protection Program checklist to~~ determine possible project related recreation contamination sources and activities, and potential sources of contamination adjacent to project waters
2. ~~(project related contamination)~~ Project related activities - waters - Monitoring for ~~evaluation~~ of any effects to water quality from project related recreational activities and facilities, including. Weekly and event-based (i.e., holiday weekends, recreation tournaments (e.g., bass tournaments)) water quality data collection during the recreation season from project waters. Target specific activities such as ~~marinas operations, boat launch facilities, campgrounds, floating campsites, houseboats, beach areas (e.g., North Forebay Recreation Area, Bedrock Recreation Area in Oroville), swimming areas,~~ floating restrooms, houseboats and pumpout facilities, fishing areas

~~facilities (e.g., fish cleaning stations, heavy fishing areas such as the Afterbay Outlet), and wave-wash induced erosion or turbidity from powerboats. Monthly or other appropriately timed (e.g., spills) monitoring of commercial and residential developments near project waters. Monitoring~~ Evaluation ~~to include microbiological indicator organisms (total and fecal coliform and enterococcus bacteria), petroleum byproducts (e.g., hydrocarbons, MTBE, oil and grease), pesticides, and nutrients.~~

3. ~~(nonNon-project related) Urban runoff~~ — Evaluation of non-project related activities that affect project waters, such as adjacent developments that contribute contaminants that may limit beneficial uses of project waters. ~~Monitor~~ Evaluation would include residential and commercial developments near project waters with potential to contribute contaminated runoff to project waters, including pesticides, petroleum products, pet~~s~~, waterfowl, and other animal wastes, leachfield effluent, septic system discharges, and nutrients.

4. Proposed project related recreational facilities - ~~Evaluate appropriateness of existing and future~~ Evaluation of proposed project related recreational facilities and activities for potential effects to water quality that may affect beneficial uses. ~~to prevent contamination of project waters from recreational activities.~~ Activities may include visitor education programs and prohibitions. ~~Investigate ways to discourage wildlife contamination of project waters (e.g., waterfowl contribution to coliform bacteria in beach areas).~~

5. ~~Information on proposed new recreational developments with potential to contaminate project waters.~~

~~6.~~ Review existing data, collect additional data where needed, and evaluated data in relation to criteria and objectives.

### **Level of Analysis:**

Review existing data from project waters, recreational facilities, and adjacent sources of contaminants to project waters. Collect additional data, where needed, and evaluate to determine effects to project waters from recreational developments and adjacent developments.

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**W6. Metals and Toxins Accumulation in Sediments and Aquatic Food Chain**

**Issue Statement:** Effect of existing and future project facilities and operations on sediment deposition and potential impoundment of metals and toxins, including the potential presence and uptake of methylmercury through the food chain. Lake Oroville, fed by tributaries that have a history of gold mining activity, has potential for accumulation of elemental mercury in its basin sediments.

**Resource Goals:** Minimize project effects, to the extent possible, upon bioaccumulation in the aquatic food chain of metals and other toxic contaminants.

**Scope:** Within the FERC project boundary and as appropriate outside of project boundary for project related effects.

**Existing Information:**

1. Goals and criteria from W3.
2. Initial Information Package - identifies and analyzes existing water quality information, summarized in W3.
3. State Water Resources Control Board Toxic Substances Monitoring Program database from 1978 to 1995 lists significant levels of mercury and other metals in suckers, catfish, and bass from the Feather River downstream from Oroville Dam and in the vicinity of Highway 99.
4. DWR report "Evaluation of toxic substances in fish, benthic organisms, and sediment in the State Water Project" in 1987 found mercury in fish from Oroville Reservoir at concentrations that exceed current criteria

**Information Needed:**

1. Analysis of ~~sport-selected fish species~~ organisms comprising the food chain in project waters for metals and organic contaminant concentrations. -Using a phased approach, if ~~If significant concentrations of metals or organic contaminants are found in fish in the reservoir, then analyses would include~~ 1) aquatic organisms comprising the food chain, such as aquatic macroinvertebrates, and sediments in the reservoir would be analyzed for the presence of metals and organic contaminants. 2) fish, other aquatic organisms, and sediments upstream from the reservoir to determine if levels of contaminants are amplified due to the reservoir, and 3) fish, other aquatic organisms, and sediments in the Feather River downstream from the dam to determine downstream effects of the project.

2. As appropriate, results from Geology, Soils, and Geomorphic Processes studies G1 and G4.

~~3.~~ 3. Analysis of data in comparison to established criteria.

## Level of Analysis:

Review of available data for fish analyses, collect additional fish, other aquatic organism, and sediment samples where necessary, and evaluate potential project effects for metals and organic contaminants ~~in fish~~ in concentrations that exceed criteria. Comparison of results from fish in the reservoir with established criteria will determine the need for subsequent sampling and analyses of the reservoir food chain and sediments, tributaries, and downstream Feather River, and need for development of mitigation measures.

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**W13. Hatchery Effects on Water Quality**

**Issue Statement:** Effects of existing and future hatchery operations on water quality and water temperatures in the Feather River and Afterbay.

**Resource Goals:**

- Minimize effects of project related hatchery operations on water quality and temperature in project waters
- Ensure suitable water temperatures for salmonids in both the Feather River Hatchery and low flow section of the Feather River.
- Maintain suitable water quality for beneficial uses in the Feather River downstream from the hatchery.

**Scope:** Within the FERC project waters and the Feather River to Honeycut Creek downstream to limit of hatchery influence (Yuba River?).

**Existing Information:**

1. Goals and criteria from W3 and W10.
2. Initial Information Package - identifies and analyzes existing water quality and temperature information, summarized in W3.
3. Salmonid temperature preference studies and reviews, including U.C. Davis laboratory temperature preference study for steelhead trout.
4. A ~~m~~Mean monthly temperature model for the Feather River has been developed, and a model based on one-~~hour~~ increments is planned.
- ~~5.~~ 5. National Marine Fisheries Service temperature criteria for the Feather River low flow section.
6. NPDES permit for the Feather River Fish Hatchery and monitoring data?
4. List of chemicals used at the hatchery Hatchery chemicals.

**Information Needed:**

1. Any proposed changes in hatchery operations, including discharge or waste disposal procedures, chemical useage, and hatchery temperature requirements.
2. 2. Water quality data including effluent constituents related to hatchery operations and the Feather River upstream and downstream from the hatchery, including groundwater or sub-surface flow from the hatchery waste treatment ponds ~~from W3.~~



3. Model for prediction of daily maximum, minimum, and mean water temperatures at the hatchery, low flow section of the Feather River, and Feather River downstream from the Afterbay Outlet as affected by initial temperatures in water released from Oroville Dam

~~3. Continuous temperature recording~~ Temperature recorder data for water released to the Feather River from Oroville Dam, the Feather River low flow section, Fish Hatchery, and the Thermalito facilities (Forebay, Power Canal, and Afterbay), Outlet, and temperature profiles for the Forebay and Afterbay and downstream on the Feather River downstream from the Afterbay Outlet as necessary for model development and verification ~~(meteorological station data and temp profile data will be collected under W10).~~

~~4. Hourly Daily max/min temperature model data for the low flow section of the Feather River, Feather River Hatchery discharge, Feather River downstream from the Afterbay Outlet, Thermalito Power Canal, and Thermalito Afterbay Outlet.~~

~~5. Definitive temperature preference and tolerance for chinook salmon and steelhead trout in the Feather River. Review of temperature preferences pertinent to Feather River fish.~~

~~Temperature model based on one hour increments for effects to water temperatures in the Feather River from hatchery discharges and reservoir withdrawal level~~

6. Review existing information, collect additional information where needed, develop temperature model, and analyzed data and model results to determine both beneficial and detrimental effects of project related hatchery operations on project waters, including a) effects to beneficial uses (e.g., agriculture, fisheries and other in-stream resources, etc.) of temperatures in water released from Oroville Dam to the Feather River for maintenance of water temperatures at the hatchery, b) effects to water temperatures in the Feather River from water discharged from the hatchery, c) effects of discharges from the Feather River Hatchery on water quality in the Feather River, and d) effects of water released from Oroville Dam for temperature maintenance at the hatchery on water quality in the Feather River.

~~7. Evaluate potential positive effects of hatchery operations on water quality downstream.~~

~~8. Effluent constituents~~

### **Level of Analysis:**

Review of temperature requirements and hatchery operations, temperature and water quality monitoring under various temporal and hydrologic conditions (i.e., water year types), and temperature model development and refinement.

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**W17. Project Effects on Groundwater including hyporheic zone**

**Issue Statement:** Effects of reservoirs and Feather River downstream of Oroville Dam on groundwater quality and quantity (e.g. hyporheic zone interaction).

~~(note: add definition of hyporheic)~~ (The “hyporheic zone” comprises the interstices or spaces in the mixture of coarse sand, gravel, and rocks beneath and beside a river or stream. The spaces are permeated by flowing water in contact with that in the stream, and are inhabited by a variety of insects and other aquatic organisms)

**Resource Goals:**

- Minimize adverse project effects on groundwater movement, groundwater quality and quantity level.

**Scope:** Within the FERC project boundary and adjacent to project boundary for project related effects.

**Existing Information:**

1. Goals and criteria from W3.
2. Initial Information Package - identifies and analyzes existing water quality information, summarized in W3.
3. Groundwater level and quality data from DWR

**Information Needed:**

1. Water quality data from project waters from W3.
2. ~~Gather~~ Evaluation of existing groundwater quality and level measurement data from the Oroville, Thermalito Forebay, Thermalito Afterbay, Oroville Wildlife Area, and Feather River areas, and surrounding areas
3. If existing data indicate potential adverse effect to groundwater, investigate and conduct additional groundwater data collection, including chemical analyses ~~or isotope data for water from Lake Oroville and Feather River to determine source in groundwater~~ and groundwater level measurements to develop quarterly groundwater level contour maps

- ~~4. 4.~~ Collate existing data, collect new data as needed, and analyze data to determine any adverse project effects to groundwater.
- ~~5. Quarterly groundwater level contour maps~~

**Level of Analysis:**

Review existing data, collect additional data as needed, and evaluate data to determine project effects to groundwater quality, quantity, and flow.